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DESK SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates generally to a desk system to be used in a work environment, and in particular, to a modular desk for use in such a system.

Large open office spaces are commonly partitioned into workstations through the use of wall panel systems. Panel systems typically consist of free standing panels that are joined together in a spatial pattern to define the desired sub-area or workstation space. Each workstation space is then supplied with individual workstation components such as desks, file-cabinets and storage space. Some of these workstation components are attached directly to and supported by the panels. In addition to providing a divided work space, panel systems also typically provide cable management systems for power and data transmission cables.

Although useful, office panel systems lack a certain degree of versatility and flexibility. Most importantly, they can be difficult to disassemble, reconfigure and reassemble. Indeed, a skilled mechanic may be needed to reconfigure certain panel workstations. In the modern office environment, however, workstations can require frequent reconfiguration as new work projects evolve, thereby requiring new work environments. In addition, it is often desired to maintain an open work environment, without the interference of walls or panels, so as to facilitate communication between team members using the workstation.

To counter some of these problems, some office space environments employ free standing desk systems and storage units, which can be organized into workstations that promote team work and open communication. Because each free standing furniture unit is independently supported on the floor of an open office space, they typically are easy to relocate and require minimal disassembly. However, many free standing desk systems have rigid designs that limit the number of ways the desk systems can be configured in an office environment. Such rigidity often makes it difficult to assemble and disassemble the desk systems and makes it

difficult to convert an office from an open plan to a closed plan. The rigidity of prior desk system plans has also resulted in limiting the number of storage options for a user of the desk system.

Many past desk systems have used modular desks that have presented a sense of privacy to the user while at the same time being obtrusive by presenting a hemmed in feeling to the user. Such a hemmed in feeling could lead to less productivity by the user of the modular desk.

Another disadvantage of many modular desk systems is that they are not equipped for the modern office environment. With electronic technology being a big part of most work environments, office furniture systems must be responsive to managing such key functions as energy distribution, cable management, outlet access, and equipment support. Most desk systems do not accommodate these many needs. For example, most desk systems do not have their own power distribution systems. Thus, to provide power to various office equipment, such as computers, each desk in the system must be located near an outlet.

Even for those modular desk systems that provide energy distribution and cable management, they suffer from limiting the cable wire capacity and accessibility to the cable wiring. Furthermore, such modular desk systems often encounter problems with loss of data information that is being sent by the cable wiring of the desk system.

SUMMARY OF THE INVENTION

One aspect of the present invention regards a modular desk positioned on a floor that includes a worksurface member with a top surface and a bottom surface and a first floor stanchion having a trapezoidal shape that is supported on the floor and supports the worksurface member. A second floor stanchion is supported on the floor and supports the worksurface member.

A second aspect of the present invention regards a modular desk positioned on a floor that includes a worksurface member with a top surface and a bottom surface and a first floor stanchion that is supported on the floor and supports the worksurface member. A second floor stanchion is

supported on the floor and supports the worksurface member leg. A J-shaped bracket is attached to the first floor stanchion and the second floor stanchion and a second bracket is attached to the first floor stanchion and the second floor stanchion.

A third aspect of the present invention regards a storage member structure positioned above a floor that includes a first vertical support that is supported on the floor and a second vertical support that is supported on the floor and is spaced from the first vertical support. A storage member is attached to the first vertical support and a compressive attachment system compressively attaches the storage member to the second vertical support.

A fourth aspect of the present invention regards a storage member structure positioned above a floor that includes a first vertical support that has a trapezoidal shape and is supported on the floor. A second vertical support is supported on the floor and is spaced from the first vertical support. A storage member is attached to the first vertical support and the second vertical support.

A fifth aspect of the present invention regards a desk that carries wire cabling that includes a worksurface member with a top surface. A first floor stanchion and a second floor stanchion are supported on the floor and support the worksurface member. A bracket attached to the first floor stanchion and the second floor stanchion and supporting cable wiring, wherein the bracket shields the cable wiring from electromagnetic energy.

A sixth aspect of the present invention regards a modular desk system that is capable of being converted from an open plan desk to a closed plan desk, the modular desk system including a worksurface member with a top surface. A first floor stanchion and a second floor stanchion that are supported on the floor and support the worksurface member. A lower panel attached to the first floor stanchion and to the second floor stanchion, wherein the lower panel has a lower edge that is flush with the bottom edges of the first and second floor stanchions, the lower panel has a structure so as to be attachable to the first floor stanchion and the second floor stanchion so that a top edge of said lower panel is flush with the top edges of the first and second

floor stanchions and the lower edge of the lower panel is approximately 18 inches above the floor.

A seventh aspect of the present invention regards a method of converting a modular desk used in an open plan to a modular desk in a closed plan, the method includes removing an upper panel attached to a first floor stanchion and a second floor stanchion that support a worksurface member. Removing a lower panel attached to the first floor stanchion and the second floor stanchion so that a top edge of the lower panel is flush with top edges of the first and second floor stanchions and the lower edge of the lower panel is approximately 18 inches above the floor.

An eighth aspect of the present invention regards a screen system that includes a first floor stanchion that is supported on a floor and a second floor stanchion that is supported on the floor. A first bracket is attached to the first floor stanchion and the second floor stanchion. A second bracket is attached to the first bracket, wherein the second bracket defines a first channel and includes a stop that protrudes within the channel. A screen that includes a bracket that defines a second channel that is aligned with the first channel. A bayonet that attaches the screen to the first bracket by being inserted into the first channel and the second channel, wherein a lower end of the bayonet is supported within the first channel by the stop.

A ninth aspect of the present invention regards a storage member structure positioned above a floor that includes a first vertical support that is supported on the floor and a second vertical support that is supported on the floor and is spaced from the first vertical support. A bracket is attached to a top surface of the first vertical support, wherein the bracket includes an arm. A storage member is supported on and attached to the arm, the storage member is able to be attached to various attachment positions along the length of the arm.

A tenth aspect of the present invention regards a stackable storage unit that includes a first module with a bracket attached to a top surface of the first module. A second module includes a second bracket attached to a bottom surface of the second module, wherein the first and

second modules are attached to one another at a first position by an attachment device that engages the first and second brackets.

The present invention provides significant advantages over other desk systems. For example, the first, second, third, fourth and sixth through tenth aspects of the present invention provide improved adjustability that increases the number configurations for a desk system, improves the ability to convert from an open plan to a closed plan and vice versa and improves the ease of assembling and disassembling a desk systems.

The third, fourth, ninth and tenth aspects of the present invention provides in increasing the number of storage options for a user of the desk system.

The first and fourth aspects of the present invention provides a less obtrusive working environment while at the same time providing a sense of privacy.

The second aspect of the present invention provides improved cable wire capacity and accessibility to the cable wiring.

The fifth aspect of the present invention provides improved retention of data information that is being sent by the cable wiring of a desk system.

The present invention, together with further objects and advantages, will be best understood by reference to the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a modular desk according to the present invention;

FIG. 2 is a left side view of the modular desk of FIG. 1;

FIG. 3 is a top view of the modular desk of FIG. 1;

FIG. 4 is a front view of the modular desk of FIG. 1;

FIG. 5 is a perspective view of a floor stanchion that is used with the modular desk of FIG. 1;

FIG. 6 is a left side view of the floor stanchion of FIG. 5;

FIG. 7 is a right side view of the floor stanchion of FIG. 5;

FIG. 8 is a front view of the floor stanchion of FIG. 5;

FIG. 9 is a rear view of the floor stanchion of FIG. 5;

FIG. 10 is a top view of the floor stanchion of FIG. 5;

FIG. 11 is a bottom view of the floor stanchion of FIG. 5;

FIG. 12A is a front view of a cover to be used with the floor stanchion of FIGS. 5-11;

FIG. 12B is a cross-sectional view of a cover taken along line A-A of FIG. 12A;

FIG. 13 is a perspective view of an upper bracket to be used with the modular desk of FIG. 1;

FIG. 14A is a perspective view of a lower bracket to be used with the modular desk of FIG. 1;

FIG. 14B is a side view of the lower bracket of FIG. 14A;

FIG. 15A is a perspective view of a retainer to be used with the lower bracket of FIGS. 14A-B;

FIG. 15B is a side cross-sectional view of the retainer of FIG. 15A;

FIG. 16A is a perspective view of an upper front panel to be used with the modular desk of FIG. 1;

FIG. 16B is a side view of the upper front panel of FIG. 16A;

FIG. 16C is a front view of the upper front panel of FIG. 16A;

FIG. 17A is a perspective view of a lower front panel to be used with the modular desk of FIG. 1;

FIG. 17B is a side view of the lower front panel of FIG. 17A;

FIG. 17C is a front view of the lower front panel of FIG. 17A;

FIG. 18 is a perspective view of a lower portion of the modular desk of FIG. 1;

FIG. 19 is a front view of the lower portion of FIG. 18;

FIG. 20 is a right side view of the lower portion of FIG. 18;

FIG. 21 shows a side cross-sectional view of the lower portion of FIG. 18;

FIG. 22 is a rear view of the lower portion of FIG. 18;

FIG. 23 is a perspective view of the lower portion of FIG. 18 when a back panel is attached thereto;

FIG. 24 is a side view of the lower portion of FIG. 23;

FIG. 25A is a perspective view of a cover to be used with the modular desk of FIG. 1;

FIG. 25B is a side view of the cover of FIG. 25A;

FIG. 26 is a side view of a first embodiment of a bracket that can be used with the modular desk of FIG. 1;

FIG. 27 is a side view of a second embodiment of a bracket that can be used with the modular desk of FIG. 1;

FIG. 28A is a perspective view of a third embodiment of a bracket that can be used with the modular desk of FIG. 1;

FIG. 28B is a side view of the bracket of FIG. 28A;

FIG. 29 is a perspective view of a first embodiment of a leg support that can be used with the modular desk of FIG. 1;

FIG. 30A is a perspective view of a second embodiment of a leg support that can be used with the modular desk of FIG. 1;

FIG. 30B is a side view of the leg support of FIG. 30A;

FIG. 31 is a top view of a first embodiment of a desk system that uses a modular desk according to the present invention;

FIG. 32 is a front view of area A of the desk system of FIG. 31;

FIG. 33 is a front view of area B of the desk system of FIG. 31;

FIG. 34 is a top view of a second embodiment of a desk system that uses a modular desk according to the present invention;

FIG. 35 is a top view of a worksurface member to be used with the desk system of FIG. 34;

FIG. 36 is a perspective view of the worksurface member of FIG. 35;

FIG. 37 is a front view of the worksurface member of FIG. 35;

FIG. 38 is a front view of area A of the desk system of FIG. 34;

FIG. 39 is a front view of area B of the desk system of FIG. 34;

FIG. 40 is a front view of area C of the desk system of FIG. 34;

FIG. 41 is a front view of area D of the desk system of FIG. 34;

FIG. 42 is a perspective view of an L-shaped modular desk according to the present invention;

FIG. 43 is an enlarged view of a corner of the L-shaped modular desk of FIG. 42;

FIG. 44A is a perspective view of a corner stanchion to be used with the modular desk of FIG. 43;

FIG. 44B is a top view of the corner stanchion of FIG. 44A;

FIG. 45 is a top view of a third embodiment of a desk system that uses a modular desk according to the present invention;

FIG. 46 is a front view of area A of the desk system of FIG. 45;

FIG. 47 is a front view of area B of the desk system of FIG. 45;

FIG. 48 is a front view of area C of the desk system of FIG. 45;

FIG. 49 is an exploded view of a corner of a portion of the desk system of FIG. 45;

FIG. 50 schematically shows the floor stanchions when desks are positioned back-to-back to each other;

FIG. 51A is a perspective view of a first embodiment of an amenity rack;

FIG. 51B is a perspective view of a second embodiment of an amenity rack;

FIGS. 52A-M show a number of amenities that can be used with the amenity racks of FIGS. 51A-B;

FIG. 53 shows a perspective view of a shelf to be used with the amenity racks of FIGS. 51A-B;

FIG. 54 shows a side view of the shelf of FIG. 53;

FIG. 55 shows a top view of the shelf of FIG. 53;

FIG. 56 shows a front view of the shelf of FIG. 53;

FIG. 57 shows a perspective view of a disk storage unit to be used with the amenity racks of FIGS. 51A-B;

FIG. 58 shows a side view of the disk storage unit of FIG. 57;

FIG. 59 shows a top view of the disk storage unit of FIG. 57;

FIG. 60 shows a front view of the disk storage unit of FIG. 57;

FIG. 61 shows a perspective view of a support surface to be used with the modular desk of FIG. 1;

FIG. 61A shows a rear perspective view of a support surface to be used with the modular desk of FIG. 1;

FIG. 61B shows a front perspective view of the support surface of FIG. 61A;

FIG. 62A shows a rear perspective view of a corner support surface to be used with the modular desk of FIG. 1;

FIG. 62B shows a front perspective view of the corner support surface of FIG. 62A;

FIG. 63A shows a rear view of an upper bracket to be used with the modular desk of FIG. 1;

FIG. 63B shows a top view of the upper bracket of FIG. 63A;

FIG. 64A shows an interior perspective view of an embodiment of a rear panel to be used with the modular desk of FIG. 1;

FIG. 64B shows an interior rear view of the rear panel of FIG. 64A;

FIG. 65A shows an interior perspective view of a second embodiment of a rear panel to be used with the modular desk of FIG. 1;

FIG. 65B shows an interior rear view of the rear panel of FIG.

65A;

FIG. 66A shows a perspective view of a cap to be used with the floor stanchion of FIGS. 5-7;

FIG. 66B shows a perspective view of a cap to be used with the floor stanchion of FIG. 44A;

FIG. 67 shows a side view of a draw rod;

FIG. 68 shows a side view of a modular desk with a shelf;

FIG. 69A shows a bottom perspective view of a lower spacer;

FIG. 69B shows a top perspective view of the lower spacer of FIG. 69A;

FIG. 70A shows a bottom perspective view of an upper spacer;

FIG. 70B shows a top view of the upper spacer of FIG. 70A;

FIG. 71 shows a perspective view of an embodiment of an upper stanchion;

FIG. 72 shows a perspective view of a second embodiment of an upper stanchion;

FIG. 73 shows a right side view of the upper stanchion of FIG. 72 attached to the floor stanchion of FIGS. 5-7;

FIG. 74 is a cross-sectional view of the support of FIG. 73;

FIG. 75A is a perspective view of a bracket to be used with the modular desk of FIG. 1;

FIG. 75B is a top view of the bracket of FIG. 75A;

FIG. 75C is a front view of the bracket of FIG. 75A;

FIG. 75C is a side view of the bracket of FIG. 75A;

FIG. 75D is a bottom view of the bracket of FIG. 75A;

FIGS. 76A-C and 77A-C show various embodiments of a lower module according to the present invention;

FIGS. 78A-E and 79A-E show various embodiments of a middle and upper module according to the present invention;

FIGS. 80A-B, 81A-B and 82A-B show various embodiments of another module according to the present invention;

FIG. 83 is a perspective view of a cut away view of a lower

module; and

FIG. 84 is a top view of a bracket system employed by the modules of FIGS. 76-83.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, FIGS. 1-75 show several embodiments of a modular desk 100 that is positioned on a floor 102. FIGS. 1-11 and 19-33 show an embodiment of the modular desk 100 that has a planar worksurface member 104 that is approximately 1.125 inches thick and has a rectangular top surface 106 that has a length of approximately 48 inches and a width of approximately 22.5 inches. The worksurface member 104 is made of a durable material such as high pressure laminate, medium density particle board or medium density veneer.

The worksurface member 104 is supported above the floor 102 by being attached to a pair of vertical floor stanchions 108 and 110 that are supported on the floor 102. The floor stanchions 108 and 110 are separated from one another by approximately 46 inches.

The floor stanchion 108 has a shape that is identical to that of the floor stanchion 110. Accordingly, the description to follow regarding stanchion 108 is equally applicable to stanchion 110. As shown in FIGS. 5 and 8, the floor stanchion 108 has a U-shaped front surface 112 that is integrally attached to an interior side wall 114 and an exterior side wall 116 that are parallel to one another and separated from one another by approximately 1.125 inches. Each side wall 114 and 116 is identical in shape with an opening 118 formed in the rear portion of the side wall. An upper rear wall 120 is attached to the side walls 114 and 116 and extends to the top edge of the opening, while a lower rear wall 122 is attached to both of the side walls 114 and 116 and extends from the lower edge of the opening 118. A top stanchion surface 124 is integrally attached to the front surface 112, the side walls 114, 116 and the upper rear wall 120. Similarly, a bottom stanchion surface 126 is integrally attached to the front surface 112, the side walls 114, 116 and the lower rear wall 122. The top stanchion surface 124 is approximately rectangular in shape having a length of approximately 4.25

inches and a width of approximately 1.125 inches. The bottom stanchion surface 126 is parallel to the top stanchion surface 124 and is rectangular in shape having a length of approximately 6.1 inches and a width of approximately 1.125 inches. The bottom stanchion surface 126 preferably has a threaded opening to receive a threaded bolt of an adjustable floor support 128 where rotation of the threaded bolt results in raising or lowering the floor stanchion relative to the floor 102.

The opening 118 is approximately rectangular in shape with a height of approximately 7.125 inches and a width of approximately 2.125 inches. The lower edge of the opening 118 is positioned approximately 14.8 inches above the floor 102 so as to be aligned with cable and wire management structure associated with the modular desk 100. When floor stanchions of two modular desks 100 are positioned adjacent to one another, the openings 118 formed in each adjacent floor stanchion face each other and are substantially aligned with each other and allow cables and wire to pass from one modular desk to the other.

If the opening 118 is not to be positioned adjacent to another opening 118 as described above, then the opening 118 is blocked by a rectangular cover 130 (see FIGS. 12A-B) that is removably attached to the exterior side wall 116 of the floor stanchion 108, 110. The cover 130 preferably is made of a plastic and has an engagement tab 131 that engages the edges of the exterior side wall 116 formed by the opening 118 so as to snap attach the cover 130 to the side exterior side wall.

When the cover 130 is attached to the exterior side wall 116, the exterior side wall and the cover define a wall that has the shape of a trapezoid. The edges of the trapezoid are defined by the side edges of the side wall 116 and the cover 130. In particular, the trapezoid has a top edge 132 that has a length of approximately 4.3 inches, a base 134 having a length of approximately 6.1", a front edge 136 having a length of approximately 29.94 and a rear edge 138 having a length of approximately 29.88 inches. As shown in FIGS. 5-7, the front surface 112 and the front edge 136 are angled relative to the top stanchion surface 124 by an obtuse angle θ that is

approximately 93.5°. Furthermore, the edges of the rear walls 120, 122 and the cover 130 and the rear edge 138 are approximately perpendicular to the top and bottom stanchion surfaces 124, 126.

The floor stanchions 108 and 110 are attached, via bolts, to an upper bracket 140 and a lower bracket 142 that are both J-shaped. The upper bracket 140 is positioned horizontal to the floor and is approximately 31 inches above the floor 102 so as to be the same height as the top stanchion surfaces 124 of the stanchions 108 and 110. The upper bracket 140 extends so that its ends are adjacent to the stanchions 108 and 110 where they are bolted to the interior side walls 114 of the stanchions. As shown in FIG. 13, the upper bracket 140 has a 7.5 inch vertical surface 141, a 2.25 inch horizontal surface 143 and a secondary vertical surface 145 that is approximately 1.1 inches high. The surfaces 141, 143 and 145 define a channel into which cable wire for providing electricity for amenities and the like associated with the desk 100 is laid. The secondary vertical surface 145 is positioned nearer the worksurface member 104 than the vertical surface 141 so as to allow easy access to the cable wire from the opening defined between the rear of the work surface member 104 and the vertical surface 141.

The lower bracket 142 is parallel to the upper bracket 140 and is positioned approximately 14 inches above the floor so that its ends are aligned with and inserted into the openings 118 of the stanchions and bolted thereto. As shown in FIGS. 14A-B, the bracket 142 has three surfaces: an interior surface 144, a support surface 146 and an exterior surface 148 that are integrally formed from the same material. The interior surface 144 is located nearest the worksurface and is perpendicular to the support surface 146. The top edge of the interior surface is approximately 2.6 inches above the support surface 146. The exterior surface 148 lies parallel to and approximately 2.125 inches from the interior surface 144. The top edge of the exterior surface 148 lies approximately 1.7 inches below the top edge of the interior surface 144 so as to allow communications cable and wiring 150 to be inserted from the back of the modular desk 100, past the exterior surface 148

and onto the support surface 146. As described above, the bracket 142 is aligned with the covers 130 of the floor stanchions 108, 110 so as to allow communications cable and wiring 150 to be threaded through the openings 130 and laid in the J-shaped bracket 142 of an adjoining modular desk 100.

The communications cable and wiring 150 is retained within the channel defined by the surfaces 144, 146 and 148 by a 1.125 inch long plastic retainer 152 (see FIGS. 15A-B) that has a pair of legs 153, 155 that form a slot into which the top edge of the exterior surface 148 is inserted. Besides communications cable and wiring, the bracket 142 can support one or more serially connected power distribution servers and electrical power harnesses 154 that are positioned below and attached to the support surface 146 by hook brackets locked in place by spring snaps An example of acceptable distribution servers and electrical power harnesses are those described in U.S. Patent No. 5,112,240, the entire disclosure of which is hereby incorporated by reference.

As mentioned previously, the upper bracket 140 carries electrical wiring for the amenities associated with the desk. The electrical wiring can generate electromagnetic energy that can affect the integrity of the data being transmitted over the communications cable and wiring 150 supported by the lower bracket 142. Accordingly, the lower bracket 142 is grounded so as to shield the communications cable and wiring 150 from the electromagnetic energy. Similarly, the upper bracket 140 may be grounded so as to shield its electrical wiring from any electromagnetic energy produced by the communications cable and wiring 150.

After the cables and wiring and power modules 154 have been installed, panels 156 and 158 are attached to the modular desk 100 so as to enclose the cables and wiring and the power modules 154. As shown in FIGS. 16A-C and 21, a pair of U-shaped hinge elements 159 are bolted to the interior surface 144 of the lower bracket 142 so that the opening of the elements face upwards. The lower edge of the upper front panel 156 has a pair of hooked portions 161 that engage the hinge elements 159 so that the upper front panel 156 is able to pivot from an open position where the lower

bracket 142 is exposed to a closed position where the lower bracket 142 is hidden. At the closed position, the upper edge 163 of the upper front panel 156 engages the top edge of the secondary vertical surface 145 of the upper bracket 140 as shown in FIG. 21.

The lower front panel 158 is also pivotably mounted to the lower bracket 142. As shown in FIGS. 17A-C, a pair of U-shaped brackets 163 are attached to the bottom side of the support surface 146 of the lower bracket 142. The lower edge of the lower front panel 158 has a pair of hooked portions that engage the closed ends of the U-shaped brackets 165 so that a hinge is formed. As shown in FIG. 21, the lower front panel 158 pivots from an open position that exposes the power modules 154 to a closed position where the power modules 154 are hidden. At the open position, the lower front panel 158 can be slid underneath the support surface 146. When the lower front panel 158 is pivoted downward to cover the power modules 154, the lower edge of the lower front panel 158 is approximately 14 inches above the floor 102. Pivoting of the lower front panel 158 upward allows for easy access to the power modules 154. As shown in FIG. 4, the upper front panel 156 has one or more rectangular openings 160 that are aligned with communication ports connected to the communications cabling and wiring laid in the bracket 142. Similarly, the lower front panel 158 has one or more rectangular openings 162 that are aligned with electrical outlets that are connected to the power modules 154. If either of the openings 160 and 162 are not in communication with either a port or outlet, a cover 164 is placed over the opening. Note that if there are no power modules 154, then the lower front panel 158 may be enlarged so as to extend to the floor 102.

The rear portions of the cables and wiring are hidden from sight by an upper rectangular upper rear panel 166 that is snapped into attachment with the upper rear walls 120 of the stanchions 108, 110. As shown in FIGS. 23 and 24, each end of the rear panel 166 has a lower hook 167 that engages the top edge of the lower rear wall 122 and an upper flexible insertion piece 169 that is forced through a rectangular opening 171 formed in the upper rear wall 120 and expands so as to prevent its removal therefrom. A lower

rectangular rear panel 168 is screwed to the lower rear walls 122 of the stanchions 108, 110 and bottom edge of the panel 168 is flush with the bottom edge of the bottom stanchion surface 126. The panels 166 and 168 cover the area between the stanchions 108, 112 that extends from the bottom of the stanchions to the top of the stanchions. The upper rear panel 166 and the lower rear panel 168 each have a length so as to extend to the stanchions 108, 110. The upper rear panel 166 has a height of approximately 17 inches so that its lower edge is flush with the rear edges of the power modules 154. The lower rear panel 168 has a height of approximately 13 inches and has a top edge adjacent to the bottom edge of the upper rear panel 166 and a bottom edge flush with the bottom edges of the stanchions 108 and 110. so that the panels 166 and 168 have a combined height that is approximately the same as the height of the floor stanchions 108, 110. The panels 166 and 168 may be made of steel or may be a cloth covered tile.

In those cases where the modular desk 100 is to be converted from an open plan to a closed plan where it has its back facing a permanent wall, the lower front panel 158, the lower rear panel 168 and the upper rear panel 166 are removed. The 13 inch high panel 168 is altered so as to have an upper flexible insertion piece like the upper rear panel 166 and attached to the upper rear wall 120 in the same manner as the upper rear panel 166 is attached thereto. When so attached, the bottom edge of the panel 168 is flush with the support surface 146 of the lower bracket 142 and the top edge of the panel 168 is flush with the top edges of the stanchions 108, 110. Below the rear edge of the panel 168 is a space that is 18 inches high as measured from the floor 102. Since most municipal codes require electrical outlets to be 18 inches above the floor, the attachment of the panel 168 to the top of the stanchions ensures access to the electrical outlets mounted in the permanent wall when the rear of the desk 100 is positioned adjacent to a permanent wall. Conversion of the modular desk 100 to an open plan is accomplished by attaching panels 166 and 168 in the manner described previously.

With the above-described floor stanchions 108, 110 and bracket 142, the modular desk 100 is able to support a number of items, including the

worksurface member 104. As shown in FIGS. 1-3 and 18, the bottom surface 170 of the worksurface member 104 is attached, via one or more screws, to the top surfaces 172, 173 of a pair of curved brackets 174, 176 that are attached to the floor stanchions 108, 110, respectively. Once the worksurface member 104 is attached to the brackets 174, 176, the rear edge of the worksurface member 104 is spaced approximately 0.5 inches inward from the vertical surface 141 so that an opening is formed that allows the cable wiring of the upper bracket 140 to be accessible therefrom. Note that the cable wiring of the upper bracket 140 can also be run through the channel formed by the U-shaped front surface 112 to other electrical elements located above or below the worksurface member 104. A plastic cover 175 such as shown in FIGS. 25A-B may be snap fit over the channel so as to hide the wiring within the channel.

As shown in FIGS. 1 and 26, the curved brackets 174, 176 are identical in shape and each have m = 6 number of hooks 178 that are inserted into a plurality of vertical slots 180 that are formed in the front surface 112 so as to be equidistant from one another. After the hooks 178 are inserted into corresponding slots 180, the brackets are lowered so that the hooks 178 engage a lower edge 182 associated with each slot 180. Note that the number n of slots is preferably 12. If the number of slots 180 is greater than the number of hooks, then the hooks 178 can be positioned at more than one position (number of positions = n-m+1). Accordingly, the worksurface member 104 is adjustable in height relative to the floor 102 by adjusting the location of where the brackets 174 and 176 are attached. The top surface 183 may have a variety of lengths, such as 17 inches or 12 inches, in order to support a wide variety of worksurface members 104.

It is possible that the brackets 174, 176 have other shapes without departing from the spirit of the invention. For example, both of the brackets 174, 176 may have a shorter top surface (approximately 1.6 inches long) like the bracket 182 shown in FIG. 27.

Another possibility is to use the trapezoidal bracket 184 of FIGS. 28A-B where the bracket 184 extends all the way to the floor. The bracket

184 has a front leg 186 that is perpendicular to the floor 102 and a rear leg 188 that is angled so as to be flush with the front surface 112. The bracket 184 has a height of approximately 27 inches and a width of approximately 20.5 inches or 14. 5 inches so that when it is positioned adjacent to a hall there is some privacy afforded the user of the modular desk 100. The bracket 184 is attached to a stanchion by a bottom plate that is bolted to the bottoms of the stanchion and the bracket 184 and a bolt that is inserted through the front surface 112 and a male piece 185 of the bracket 184 that is inserted into the channel formed by the U-shaped front surface 112. Note that the bracket 184 and, thus, the worksurface member 104 is not adjustable in its height relative to the floor 102. The bracket 184 has an adjustable floor support 190 similar in structure to floor support 128 described previously.

Note that any of the three embodiments of the brackets can be used on one of the floor stanchions 108, 110 while the other stanchion can use any of the three types of brackets depending on the intended use of the modular desk 100.

Just as the stanchions 108, 110 can have an assortment of brackets attached thereto so as to support the worksurface member 104, the stanchions 108, 110 can have a variety of leg supports attached thereto. As shown in FIG. 29, a triangular leg support 192 may be attached to the lower portions of the stanchions 108, 110 by inserting the hooked portions 191 into the three lower slots 187 formed in the stanchions. A bracket 189 is integrally formed with the leg support 192 and is bolted to the stanchion. Note that the triangular leg support 192 is typically used in conjunction with the bracket 174 of FIG. 26 and usually located interiorly of the edges of the worksurface member 104 so as to offer improved leg room.

FIGS. 30A-B shows an alternative design for a leg support 194 that is attached to the stanchions 108, 110 in the same manner that the leg support 192 is attached thereto. The leg support 194 extends approximately 18.4 inches or 13 inches from the stanchions 108, 110 compared to the 5.5 inches that the triangular leg support 192 extends. This allows the stanchions 108 and 110 to support larger worksurface members 104 and worksurface

members that are located at corners as will be described below.

The modular desk 100 may have a wide variety of shapes for the worksurface member 104. As shown in FIG. 44, the worksurface member 104 may have a curved interior edge 193 that juts outward from the stanchions 108, 110 with the wider portion of the worksurface member 104 being supported by the rectangular bracket 180.

The worksurface member 104 may have a shortened length and a rounded edge 195 as shown in FIG. 34 that is supported by the brackets 174, 176. In this case, the stanchions 108, 110 are separated by a distance that is approximately 30 inches and the lower bracket 142 has a length of approximately 24 inches.

Another worksurface is shown in FIG. 42. In this case, the worksurface member 104 is L-shaped where one section of the member 104 has a length of approximately 42 inches or 48 inches and the section perpendicular thereto has a length of approximately 60, 66, 72 or 78 inches. Of course, the lengths of the two sections can be equal. In the embodiment of FIG. 42, the two stanchions 108 and 110 are positioned at the ends of the worksurface member 104 and a corner stanchion 197 is positioned at an interior rear corner of the member 104. As shown in FIGS. 44A-B, the corner stanchion 197 has the same basic trapezoidal shape as the stanchions 108, 110. The corner stanchion 197 is oriented at 45° with respect to the rear edges of the two sections of the L-shaped worksurface member 104 and supports the member 104 via a pair of brackets that have the same shape and function as the brackets 174 and 176 described previously. The sides 199 and 201 of the stanchion 197 are perpendicular to one another and have slots in the same positions as the slots of the stanchions 108, 110 so as to attach brackets and leg supports thereto in the same manner that the brackets and leg supports are attached to the stanchions 108, 110 described previously.

In the embodiment of FIG. 34, a modular desk 100 with a peninsula-shaped worksurface member 198 can be placed adjacent to and attached, via bolts, to one of the sections of the member 104. The curved

free end 200 of the worksurface member 198 is further supported by a cylindrical post 202 bolted to the bottom surface 166 of the worksurface member 198. The cylindrical post 202 is height adjustable by a plastic threaded bottom piece 203 that threadedly engages a thread positioned within the post 202.

In the case of two separate worksurface members 104 that intersect one another at right angles relative to each other, a corner member 204 may be attached to the stanchions 108, 110 that are at the corner. L-shaped brackets are attached to the side walls of the stanchions 108, 110 that are adjacent to one another and the corner member 204 is placed on the L-shaped brackets and attached thereto via screws. As shown in FIG. 49, a cylindrical cover 206 may be attached to the same side walls of the stanchions 108, 110 that are attached to the L-shaped brackets. An attachment piece 208 (see FIG. 56) has a pair of rectangular walls 210, 212 that are attached to the stanchions 108, 110 by using screws. The walls 210, 212 are flush with the exterior walls 116 of the stanchions and are perpendicular to each other. A curved cover piece 214 is then attached to the free ends of the walls 210, 212 via hooks (not shown) that engage the edges 215 of the walls 210, 212.

An example of an enlarged corner member is shown in FIGS. 35-37. The corner member 214 is typically used to connect the worksurface members 104 of two modular desks 100 that are placed back-to-back to each other. When the modular desks 100 are back-to-back they are attached to one another by a bracket that is attached to each of the exterior walls 116 of the stanchions 108, 110. The bracket ensures that the stanchions 108, 110 do not separate from one another so as to create the illusion of a single stanchion with a trapezoidal shape with a base 216 having a length of approximately 12.2 inches, a top 218 having a length of approximately 8.6 inches, and two identical legs 220, 222 having a length of approximately 29.94 inches and intersecting the top 218 at an obtuse angle of approximately 93.5° (see FIG. 50). The bracket is also used to attach the corner member 214 by using screws. Further support for the corner member 214 is provided

by a cylindrical post 224 that is bolted to the bottom surface of one end of the corner member 214 as shown in FIG. 45.

With the above described worksurface members and corner members, it is possible to arrange the modular desks 100 in a multitude of possible patterns such as those shown in FIGS. 31-34, 38-42 and 45-48. For example, the plurality of modular desks 100 can be arranged in a side-by-side pattern, a back-to-back pattern, or a combination of such patterns.

When two modular desks 100 are arranged in a side-by-side pattern, opposing ends of adjacent power units 154 are also aligned. Accordingly, the first desk supplies power to the adjacent desk. When a plurality of desks are positioned together, and the desk's power units are interconnected, the entire system can be powered from a single source.

To arrange two desks in a back-to-back arrangement, the installer simply positions the desks such that the brackets 140, 142 of each desk abut each other. As shown in FIGS. 38, the stanchions 108 and 110 of the desks are aligned with each other so that their upper and lower rear walls 120 and 122 and covers 130 face each other and abut each other. In this orientation, the exterior side walls 116 of the desks lie in the same plane and generate the appearance of an enlarged trapezoid as described previously.

It should be understood that a plurality of modular desks can be arranged in a limitless number of predetermined patterns, either alone or in combination with a plurality of panels. In all such patterns, both the footprint of the modular desk and the footprint of the system are maintained as a constant by the module maintainers. Thus, any system employing the modular desk can be easily reconfigured to include accessory members, such as screens, and overhead members, alone or in combination, without having to reconfigure, move or modify the preexisting pattern of modular desks and/or panels. Similarly, cables can be passed over the back edge, stored and organized without moving any of the modular desk units.

The worksurface members 104, 198, 204, 214 described above with respect to FIGS. 1-4, 31-43 and 45-48 perform a number of functions. First and foremost, the worksurface members 104 provide a surface that can

be used as a writing surface and can be used to support a number of objects laid thereon. The worksurface members 104 also may have openings 234 formed at the rear corners that lie adjacent to the stanchions 108, 110 and the corner stanchion 197. The openings 234 are sized so that the stanchions 108, 110 and the corner stanchion 197 do not fill up the entire area of space defined by the openings 234. The area not filled in is left exposed so as to allow wires to be fed from below the worksurface member 104 to the top of the worksurface member 104 to be electrically connected to an appliance, like a telephone.

The worksurface members 104, 198, 204, 214 can be used to support a number of amenities. The amenities are supported on either rack 235 or rack 235' that include a pair of vertical posts 237 that have a plurality of horizontal bars 239 attached thereto. Each of the posts 237 has a clamp 241 that engages the rear edge of the worksurface member 104. The clamp 241 has a top piece 243 that rests on a pad 245 situated on the worksurface member. A bottom piece 247 engages the bottom of the worksurface member and is attached to the top piece 243 by a screw that threadedly engages the openings formed in the rear portions 251. Once the rack 235 is clamped to the worksurface member 104, one or more amenities can be hung from the horizontal bars 239. Examples of suitable amenities are paper trays (FIGS. 52A-C), diagonal trays (FIG. 52D), arches (FIG. 52E), organizer trays (FIG. 52F), mini shelves (FIG. 52G), rail dividers (FIG. 52H), mini-tackboards (FIG. 52I), message holders (FIG. 52J), calendar holders (FIG. 52K). card files (FIG. 52L) and tape dispensers (FIG. 52M) that are available in the desk system made by Herman Miller, Inc. of Zeeland , Michigan under the ACTION OFFICE trademark. The shelf 253 of FIGS. 53-56 and the CD storage unit 255 of FIGS. 57-60 can also be hung from the horizontal bars 239 of the amenity racks 235 and 235'.

As shown in FIGS. 61 and 62, the worksurface members 104 can also support a support surface 257 (FIG. 61) or a corner support surface 259 (FIG. 62) that use the same clamp 241 as the amenity racks 235, 235'. It should be understood that the use of clamps with the amenities allows the

amenities to be secured at an infinite number of locations along the back or side edges of the worksurface members 104, and are not dependent on any particular structure or holes for their placement.

As described previously, the modular desk 100 provides a certain amount of privacy below the worksurface member 104 through the use of the bracket 184 and the front and rear panels 156, 158, 166 and 168. The modular desk 100 is able to provide various levels of privacy above the worksurface member 104 as well. For example, privacy screens 236 may be attached on top of the upper rear panel 166 by inserting rectangular steel bayonets into the rectangular openings or channels defined by the brackets 237 attached to the rear of the vertical surface 141 as shown in FIGS. 63A-B. As shown in FIG. 63B, each bracket 237 has an inward stop 239 that the bottom end of the bayonet engages. The stop 239 supports the bayonet as the bayonet extends past the top edge of the upper bracket 140. As shown in FIGS. 64-65, the interior of different embodiments of privacy screens 236 include brackets 241 that define a channel 243 in which the bayonet can be inserted. Each bracket 241 has a stop 245 positioned at an interior end of the channel 243 that limits the extent the bayonet can be inserted into the channel 243. The combination of the brackets 237, 241 and the bayonet allow the privacy screen to be supported without using permanent attachment devices like screws.

As shown in FIGS. 64-65, the privacy screens 236 may have a variety of shapes. The privacy screen 236 may be rectangular in shape having a length equaling the length between stanchions 108, 110 and a height of either approximately 10 inches or approximately 18 inches. The privacy screen 236 may have a top surface that curves with a maximum height of approximately 18 inches and a minimum height of approximately 10 inches. In the case of using a rectangular privacy screen 236, a second upper privacy screen 238, similar in structure to the privacy screens 236 described above, can be attached to the top surface of the lower privacy screen 236. In this situation, a privacy screen 236 with four brackets 241 is used like the one shown in FIGS. 64A-B. The lower brackets 241 are used to connect the

privacy screen 236 to the upper bracket 140 in the manner described above and the top brackets 241 receive a second set of bayonets. The tops of the second set of bayonets are inserted into the lower brackets 241 of a second screen 238 such as the ones shown in FIGS. 63-64. Again, the second screen 238 is supported upright with out the use of attachment devices like screws.

Note that the privacy screens 236 and 238 may be made of a cloth covered tile or may include a semi-transparent window 239 as shown in FIGS. 38, 40 and 46-47. Note that when covered with cloth, the underlying layer of the privacy screens 236 and 238 can be a tackle material, such as fiberboard.

As shown in FIGS. 1-4, 32-33 and 38, a storage member, such as a shelf 240 or a storage cabinet 242 may be supported above the worksurface member 104. As shown in FIG. 33, the shelf 240 preferably has a length that spans at least the length between the stanchions 108, 110 and is not contained within an enclosure so that items can be easily placed on its top surface. The shelf 240 preferably is made of the same material as the worksurface member 104. The shelf 240 can be attached directly to the top of the stanchions 108, 110, 197 by removing their respective plastic caps 243 (see FIGS. 66A-B) from the top of the stanchions and using a pair of draw rods 245 (see FIG. 67) to compressively attach a metal bracket 301 to the top of the stanchions. In particular, the draw rods 245 are inserted through corresponding openings 305 formed in the bracket 301 so that their lower threaded ends 247 engage a pair of threaded openings formed in a bracket attached within the stanchions. The threaded ends 247 engage the threaded openings approximately 0.25 inches below the top of the stanchions. As the draw rods are rotated, their top ends 249 press down on the plate 307 of the bracket 301 and compress the bracket 301against the top of the stanchion. Once the bracket is compressively attached, the bottom of the shelf 240 is bolted to the horizontal plate 299 of bracket 301 (see FIGS. 75A-E).

Another example of a shelf 240 is shown in FIGS. 33 and 68. The shelf 240 is supported by a pair of vertical supports 244 and 246 that are

laterally spaced from one another and supported on the floor 102. The vertical supports 244 and 246 are identical in shape to one another. Accordingly, the description to follow regarding the vertical support 244 is equally applicable to the vertical support 246. In particular, the vertical support 244 is made of an upper stanchion 248 attached to the floor stanchion 108. The vertical support 246 has a trapezoidal shape as shown in FIG. 71. The trapezoidal shape is obtained because the front surface 250 of the upper stanchion 248 has the same shape as the front surface 112 of the floor stanchion 108 and is aligned with the front surface 112 so as to rise at an obtuse angle of approximately 93.5° relative to the top section surface 124 and a top stanchion surface 252 of the upper stanchion 248. Similarly, the rear wall or surface 254 of the upper stanchion 248 is perpendicular to the top section surface 124 and aligned with the rear walls 120 and 122 of the floor stanchion 108. The front surface 250 and the rear surface 254 are integrally attached to the top stanchion surface 252 that is parallel to the top section surface 112 and a bottom stanchion surface 256. The upper stanchion 248 has a trapezoidal-like shape in that it has two lower legs 258, 260 and a pair of trapezoidal indentations 262 that define the bottom stanchion surface 256 that is adjacent to and parallel to the top section surface 124 of the floor stanchion 108 and is parallel to the top stanchion surface 254 of the upper stanchion 248.

As shown in FIGS. 68 and 71, the upper stanchion 248 has a top edge 264 that has a length of approximately 3.7 inches, a base 266 having a length of approximately 4.25 inches, a front edge 268 having a length of approximately 9.64" and a rear edge 270 having a length of approximately 9.625 inches. The base 266 includes a pair of one inch long legs 260. The upper stanchion 248 has a maximum thickness of approximately 1.125 inches as defined as the separation between the side walls 272, 274. As shown in FIGS. 68 and 71, the cross-section of the upper stanchion 248 changes from the bottom stanchion surface 260 and the top section surface 262. Furthermore, the cross-section of the upper stanchion 248 differs from that of the floor stanchion 108.

As shown in FIGS. 68 and 69, the upper stanchion 248 is attached to the floor stanchion 108 by placing a 1.25 inch high trapezoidal-like spacer 284 on top of the top section surface 124 and under the bottom stanchion surface 260. The spacer 284 has a rectangular base that covers the top section surface and the spacer 284 is made of plastic so as to avoid metal-to metal contact between adjacent stanchions The spacer 284 has a pair of side walls 285 that have a 0.2 inch indentation in the shape of a trapezoid formed therein. The trapezoid has a base length of approximately 2.25 inches, a top length of approximately 1.4 inches and legs having a length of approximately 0.86 inches. The insertion of the spacer 284 requires that the length of the bottom stanchion surface 260 be less than that of the top section surface 124 of the floor stanchion 108 so that the trapezoidal shape of the vertical support 246 is maintained. The spacer 284 has a pair of holes that are aligned with corresponding threaded holes formed in the top section surface 124.

Attachment of the shelf 240 is similar to the attachment of the shelf 240 to the floor stanchions as described above. One difference is that the draw rods 245 are longer to take into account the height of the upper stanchion 248. Another difference is that a 0.25 inch rectangular-like upper spacer 285 (see FIGS. 70A-B) is positioned between the bracket and top of the upper stanchion 248. The draw rods 245 are inserted through corresponding openings 305 formed in the bracket 301, the upper spacer 285, the lower spacer 284 so that their lower threaded ends 247 engage a pair of threaded openings formed within the stanchions approximately 0.25inches below the top of the stanchions. As the draw rods are rotated, their top ends 249 press down on the bracket 301 and compress the bracket against the top of the upper spacer 285. Once the bracket is compressively attached, the bottom of the shelf 240 is bolted to the plate 299 of bracket 301.

As shown in FIGS. 1-4 and 72-74, the vertical supports 244 and 246 can be modified so as to have an enlarged height so as to support a storage cabinet 242. The height of the vertical supports 244 and 246 is increased by increasing the height of the upper stanchions 248 to be

approximately 17.6 inches while maintaining the same angular orientation as the front surface 250 and rear wall 254 of the upper stanchions 248 used to support the shelf 240. Thus, the vertical supports 244 and 246 have a trapezoidal shape that is similar to the trapezoidal shape formed by the shorter vertical supports 244 and 246 used to support the shelf 240.

The storage cabinet 242 that is supported by the vertical supports 244 and 246 is made of metal and has a bottom 290 and a top 292 positioned substantially parallel to and approximately 18 inches above the bottom 290. The top 292 and bottom 290 are attached to one another by a pair of side walls 294 and a rear wall 296 that is attached to the side walls 294 as well. The bottom 290, top 292, side walls 294 and the rear wall 296 define an interior volume of space 298. One or more doors 300 can be used to control access to the interior volume of space 298. The doors 300 are of a well known design where brackets are attached to the inside surfaces of the door 300 and the top 292 that allows the door 300 to be pivoted to a position parallel to the top 292 where the door 300 can be slid over the top 292. It should be understood that a wide variety of overhead storage cabinets are available. Accordingly, the overhead storage cabinet 188 is not limited to the aforedescribed storage unit.

The storage cabinet 242 is attached to each vertical support 244 and 246 by a compressive attachment system that is similar to that used to attach the shelf 240 to the shorter vertical supports 244 and 246 of FIGS. 68-71. The bracket 301 of FIGS. 75A-E has an extending arm 303 (length approximately 11.25 inches and width of approximately 0.5 inches upon which the storage cabinet 242 rests and is attached thereto. The extending arm 303 has a length such that the storage cabinet 242 can be moved to different positions on the plate 299 above the arm 303 when attached. If a rear panel is not to be used, then the rear wall 296 can be positioned on the arms 303 so as to be flush with the rear panels of the modular desk 100. If a rear panel is to be positioned in back of the storage cabinet 242, the rear wall 296 can be moved inwards by approximately one inch from the rear edge of the bracket 301 so as to accommodate the rear panel.

In addition to the shelf 240 and the overhead storage cabinet 288 described previously, various other storage devices can be used. For example, a stackable storage unit 306 can be attached to the worksurface member 104 or the panels of the desk system. Various embodiments of a stackable storage unit 306 are shown in FIGS. 76-82. Each stackable storage unit 306 is made of one, two or three modules stacked on top of one another. FIGS. 76-77 show various embodiments of the lower module 308. The front 310 of the lower module 308 has three to five doors/drawers 312 that can enclose movable shelving located in the interior of the module. In the rear portions of the two sides of the lower module 308 are two rectangular corner cutouts 316 that are aligned with each other so as to allow wiring to be passed through the module when the module is between two modular desks 100 and adjacent to the openings 118 of the modular desks. The cutouts can be closed by a cover 318 if no wiring is to be passed through.

The lower modules 308 of FIGS. 76A-C have a length of approximately 23.25 inches, a width of approximately 23.25 inches and a height of approximately 31 inches that allows the lower module 308 to be placed underneath the worksurface member 104 if no other modules are to be stacked thereon. The lower modules 308 of FIGS. 77A-C have a length of approximately 30 inches, a width of approximately 23.25 inches and a height of approximately 31 inches. The lower modules 308 are preferably made of a durable material such as steel.

A middle module 320 can be placed on top of the lower module 308. As shown in FIGS. 78A-E and 79A-E, the middle module 320 can be configured in a number of ways. For example, the module 320 may define a single space that is accessible by a pair of doors 322 (FIGS. 78A and 79A) or the space is left open for a pull out shelf 324 (FIGS. 78B and 79B). The module 320 can be divided into two main spaces by a single vertical wall 326. One of the spaces is open at one side of the module 320 revealing one or more shelves 328. The other side may be open as well revealing one or more shelves (FIGS. 78E and 79E). An adjacent side of the module 320 may be equipped with a door 322 (FIGS. 78C and 79C) or left open for a pull out

display shelf 330 (FIGS. 78D and 79D).

The middle modules 320 of FIGS. 78A-E have a length of approximately 23.25 inches, a width of approximately 23.25 inches and a height of approximately 18 inches. The middle modules 320 of FIGS. 79A-E have a length of approximately 30 inches, a width of approximately 23.25 inches and a height of approximately 18 inches. The middle modules 320 are preferably made of a durable material such as steel. Each of the middle modules 320 of FIGS. 78-79 has cable management access in each of their bottom corners.

An upper module 334 can be placed on top of the middle module 320. The upper module can have any of the structures of FIGS. 78A-E and 79A-E. As shown in FIGS. 80-82, another variation is to replace the upper and middle modules 320 and 334 stacked on the lower module 308 with a single module 338 that may include a coat rack 340 and shelving 328 (FIGS. 80A-B and 81A-B) or just shelving 328 (FIGS. 82A-B). The module 338 of FIGS. 80A-B has a length of approximately 23.25 inches, a width of approximately 23.25 inches and a height of approximately 40 inches. The modules 338 of FIGS. 81A-B and 82A-B have a length of approximately 30 inches, a width of approximately 23.25 inches and a height of approximately 40 inches. The modules 338 are preferably made of a durable material such as steel. Each of the modules 338 of FIGS. 80-82 has cable management access in each of their bottom corners.

The modules 308, 320, 334 and 338 are connected to each other by having four rectangular brackets 340 attached to each of the top corners 342 of the lower module 308 as shown in FIG. 83. The middle module 320 and the enlarged module 338 each has four such brackets 344 attached to their bottom corners 346 and top corners. When the middle module 320 or the enlarged module 338 is placed on top of the lower module 308, the brackets 340, 344 of the two modules overlie one another so that one or more of the holes formed in each of the lower module's bracket 340 is aligned with a corresponding hole formed in the overlying bracket 344. Bolts are inserted into the aligned holes and a nut is used to tighten the brackets

340, 344 against one another. The middle module 320 is attached to the upper module 334 with the same type of bracket structure. Since the connection between the middle module 320 and the lower and upper modules 308, 334 is the same, it is understood that the upper module 334 and middle module 320 can be interchanged when stacked on the lower module. This allows for a number of different storage schemes to be used with the desk system.

Another way that the stackable storage unit provides for a variety of storage schemes is that the modules 308, 320, 334 and 338 have the same cross-sectional shape, such as square or rectangular. By having a rectangular cross-section that is not in the shape of a square, the modules of FIGS. 77, 79 and 81-82 can be rotated by 180 degrees so that there sides are aligned with one another and to position shelving and doors in a desired manner. If the cross-section is in the shape of a square, the modules of FIGS. 76, 78 and 80 can be rotated by 90, 180 or 270 degrees so that the sides are aligned and a desired storage configuration is achieved. In other words, the modules can be rotated with respect to another so that a particular storage combination is presented to the user. If the storage combination is unacceptable, one or more of the modules are rotated with respect to another and/or the middle and upper modules 320, 334 are interchanged. Note that at least eight holes are formed in each of the brackets 340, 344 so as to ensure that there will be aligned holes for attachment when the modules are rotated to any position. Furthermore, since the middle and upper modules have cable access at each of their bottom corners, any orientation of the middle and upper modules will result in the cable access for two of the corners of the middle and upper modules being aligned with the two rear corners of the lower module that has cable access.

Although the present invention has been described with reference to preferred embodiments, those skilled in the art will recognize that changes may be made in form and d tail without departing from the spirit and scope of the invention. As such, it is intended that the foregoing detailed description be regarded as illustrative rather than limiting and that it is the

appended claims, including all equivalents thereof, which are intended to define the scope of the invention.